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AUTHOR Wagner, Ellen D.
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ABSTRACT

The methodology developed for the Western Cooperative for Educational Telecommunications' evaluation of the "New Pathways to a Degree" projects funded by the Annenberg/CPB Project is described. This methodology provides an approach for conducting a valid, reliable evaluation effort that is sensitive to specific institutional issues and contingencies, while providing generalizable results for cross-institutional discussions. Also included is a description of an environmental scan process that reveals the data points found most useful in evaluating distance learning projects. Seven projects were funded through the New Pathways initiative. The key to consistency in data collection and reporting within and across sites in this evaluation was to establish a framework within which the evaluations would occur. The evaluation approach used protocols for quantitative and qualitative investigation that facilitated systematic decision making with regard to: (1) context evaluation; (2) input evaluation; (3) process evaluation; and (4) product evaluation. Nine categories of information were identified as areas in which evaluative data were likely to be collected. The environmental scan provided evaluators with a way to determine the information actually being collected. Thirteen attachments illustrate the evaluation approach. (SLD)

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Evaluating Distance Learning Projects: An Approach for Cross-Project Comparisons

Ellen D. Wagner
Western Cooperative for Educational Telecommunications

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Evaluating Distance Learning Projects: An Approach for Cross-Project Comparisons

Ellen D. Wagner

Western Cooperative for Educational
Telecommunications - WICHE

A presentation at the Association for Educational Communications and Technology Conference, January, 1993, based on a paper appearing in the **Proceedings of the 8th Annual Conference on Distance Teaching and Learning**, University of Wisconsin, 8/92.

This paper will describe the methodology developed for the Western Cooperative for Educational Telecommunications' evaluation of the Annenberg/CPB "New Pathways to a Degree" funded projects. This methodology provides an approach for conducting a valid, reliable evaluation effort which is sensitive to specific institutional issues and contingencies while also providing generalizable results for cross-institutional discussions. This paper includes a description of an "environmental scan" process which revealed the data points described by the staff of the "New Pathways" funded projects as being most useful for evaluating distance learning projects.

The New Pathways to a Degree projects were funded by the Annenberg/CPB Project to provide a means of systematically assessing techniques and strategies for improving access to undergraduate degree courses and programs. This has been accomplished in large part by using a variety of telecommunications technologies. Seven projects were funded through the New Pathways initiative, involving 27 colleges and universities and three state networks. Funded projects include:

- The Community College of Maine
- Rochester Institute of Technology
- University of West Virginia System
- Oregon ED-NET
- St. Catherine's College
- IUPUI (Indiana University-Purdue University, Indianapolis)
- Northern Virginia Community College

In addition to funding these seven distance learning initiatives, the Annenberg /CPB Project also funded an independent external evaluation effort to be conducted by the Western Cooperative for Educational Telecommunications. The Western Cooperative, a program of the Western Interstate Commission for Higher Education, recently completed the first year of a two year evaluation effort. This paper will provide an overview of the processes used to undertake this evaluation and will discuss preliminary findings of the process undertaken to identify potential points for cross-project comparability.

One of the primary purposes of the evaluation was to examine data within and across projects to answer three questions:

- What are the effects of technology upon student achievement in distance learning contexts?
- What is/are the most effective mix(es) of technologies for delivering college level courses, programs and services to diverse student audiences at a distance?
- What data exist for determining the cost/benefit variables affecting programs delivered by technological means to diverse student audiences?

Even though outcomes dealing with student achievement, technology mix and cost/benefit tend to be of greatest general interest when examining distance educational programs, the determination of achievement measures, technology effectiveness or cost/benefit appears to depend upon enabling conditions and contingencies. An additional outcome of this external evaluation effort was to determine the appropriateness of asking these three questions at various points in the life of a distance learning project. It has been unclear if there are stages of project development which are common to specific categories of projects, or if there are developmental stages common to all distance learning projects. The New Pathways evaluation provided an opportunity to ascertain if there is any

discernable pattern to the stages of distance learning program development.

Clearly, it was critical to develop an evaluation strategy which was sensitive to individual project constraints, opportunities and limitations while robust enough to accommodate cross-project data comparisons. This would help establish parameters for developing generalizable guiding principles for use with projects using similar technologies, working with similar audiences and/or under comparable circumstances. Ultimately this was also seen as a way to promote transfer, diffusion and dissemination of results to be used by others who are considering the initiation of similar distance learning efforts.

The key to consistency in data collection and reporting of results within and across sites in this evaluation was to establish a framework within which the evaluations -- within *and* across projects -- would occur. The Western Cooperative for Educational Telecommunications' Technology Integration Evaluation Protocols, based upon Daniel Stufflebeam's Context /Input / Process / Product evaluation model, provided such a framework. These Evaluation Protocols demonstrate the relationships among four evaluation arenas. This approach facilitates systematic decision-making as it relates to:

- *Context evaluation* - This establishes the organizational environment and addresses the process of making organizational decisions affecting the project. This primarily employs descriptive or historical information sources, and actively addresses the development of planning decisions: change strategies, leadership strategies, integration strategies, collaborative strategies and intra/inter-institutional partnerships;
- *Input evaluation* - This identifies and examines the resources available for the project. This employs descriptive frequencies, gap analyses and forecasting, and actively addresses

resource procurement, resource dedication, resource sharing/economies of scale, tactical and strategic planning for resource procurement;

- *Process evaluation* - This identifies and examines the efficacy of procedures, operations, administration and management within and among projects. This employs qualitative methods of structured interviews and structured observations, and actively promotes implementation decisions;
- *Product evaluation* - This identifies and examines outcomes, decisions to recycle the project(s) and judgement upon the advisability of project continuance. This employs qualitative and quantitative methods for descriptive and inferential reporting, and deals with decisions to modify, revise, refocus, or terminate a specific approach, intervention of and entire application.

These Protocols were designed to utilize both qualitative and quantitative methods that are appropriate for diverse instructional projects employing technology for instructional delivery, and provide a sound foundation for decision-makers to make informed choices about the use of technology in their own content- and context-specific situations.

In addition to establishing a conceptual model for guiding the selection of data sources, the Western Cooperative's Protocols specified the process and means through which the evaluation was to be conducted. This included the selection of a team of experts experienced in both evaluation methods and with distance learning program planning and implementation. Each evaluator has been assigned to a specific New Pathways funded project for two years. Each evaluator has been expected to conduct a site visit per year for the two year's duration of the New Pathways initiative to conduct extensive interviews with project participants. Evaluators are also expected to work with their project directors and evaluators and project staff to obtain

documents, reports, and other data specified in the Evaluation Protocols. Ongoing and effective communication among the members of the evaluation team has been facilitated throughout the life of the evaluation project by means of teleconferencing, electronic mail and occasional face-to-face meetings. Evaluators also use common evaluation instruments and consistent operational guidelines. An evaluation coordinator is responsible for directing the efforts of the evaluation team and for compiling and editing the interim and final evaluation reports to each funded project and the Annenberg/CPB Project.

Each of the New Pathways funded projects included its own internal evaluation. These mean to ensure that the unique situational, institutional and environmental needs of the organizations receiving New Pathways funding have been met. However, having the internal evaluations evolve as a function of each individual project's needs meant that no assumptions could be made about comparability across projects.

The Western Cooperative's Protocols called for conducting an environmental scan of all New Pathways projects to determine what data were being (or were going to be) collected per project, and to determine the relative importance of a wide array of potential data points on a per project basis. An assessment instrument was developed to survey each funded project's staff about:

- the varieties and types of information currently being used within an institution to evaluate the effectiveness of instructional initiatives;
- the type of information to be collected for the New Pathways evaluation;
- whether or not the collected information could be reported in New Pathways evaluation reports
- whether or not forms were currently available to collect the desired information;

- the perception on the part of the project staff about the relative importance of the various data points included in the environmental scan to their own project's evaluation.

Nine categories of information were identified as arenas within which evaluative data were likely to be collected. They included institutional characteristics; faculty characteristics; student characteristics; student psychographics; student achievement; course development; faculty development; support services; and technology mix. Within these nine categories a total of 117 individual data sources were identified. These data sources were presented as an exhaustive (albeit not exclusive) enumeration of commonly cited sources of information for evaluating distance learning projects. This list was generated with the input of:

- New Pathways Associates (data collected during the first New Pathways Associates meeting held in Alexandria, Virginia in late April, 1991);
- Annenberg/CPB staff involved with the New Pathways projects;
- Members of the Western Cooperative's New Pathways evaluation team; and
- A review of literature of technology-based instructional projects.

Project directors were asked to confer with their project teams to complete the environmental scan. Each project director was expected to indicate the varieties, sources, accessibility and perceived value of the data being collected for use in their own project evaluations. With this information it would then be possible to determine whether or not cross-project comparisons on a per variable basis was remotely feasible.

Five of the seven funded projects completed and returned their evaluation forms by the requested deadline. The two remaining projects, both being state networks, reported that the data sources

were hard to identify because of the multi-institutional nature of their projects.

The responses to the environmental scan provided evaluators with a means of determining the types of information actually being collected for evaluation purposes for each of the projects. It also provided a means of determining the types of information that were perceived to be of greatest value by the project directors.

Project directors had been asked to rank the relative importance of the 117 data sources noted on the environmental scan for evaluating their New Pathways project from their own project perspective. Responses were recorded using a Likert-styled five point scale, with "5" noted as "most important" and 1 noted as "least important". Tabulation of results of the most important data points was accomplished by recoding the "most important" category to include points 4 and 5 on the ranking scale. Recoding was also undertaken when tabulating the data sources ranked as least important by combining responses ranked with a "1" or a "2".

The twelve categories of information which received the highest overall ranking (that is, receiving either a 4 or a 5 ranking from each of the five institutions) for their value in conducting distance learning project evaluations are noted below. They include:

- Profile of population served;
- Number of students served;
- Student motivation for pursuing distant learning experiences;
- Course completion;
- Course satisfaction;
- Media services for faculty;
- Media services for students;
- On-line library services;
- Cost of course delivery for technology based courses;
- Computer networks used;
- Pre/post course attitudes of students;
- Pre/post course attitudes of faculty.

Project staff were interviewed about their preferred evaluative data point selections,

particularly since there were virtually no indicators through which student achievement could be determined in the "most important category". The general consensus was that while student achievement is one of the important determinant for persuading an institution to initiate a distance learning initiative, it is even more important to first have a technology system in place (including staff support, library resources and media support for faculty and student) which is reliable and capable of meeting student needs and demands. It is also critical that sufficient numbers of students are being served, and that the students receiving courses at a distance are satisfied with the experience, that the distance learning option compares favorably to the traditional, face-to-face option from a marketing perspective. Only after a distance delivery system is in place and there are sufficient numbers of satisfied students receiving instruction at a distance are institutions able to devote significant energy toward determining student achievement outcomes in distance learning experiences.

When asked about cost/benefit variables, project directors noted that while it is critical to show comparability of cost between tradition and technologically delivered courses and program, the means through which those determinations can be made provide a fair amount of leeway in making those cost determinations. For example, the heavy capital outlay for technology can be offset through reported saving in travel, in in facilities costs savings or of having access to additional sources of revenue from ad hoc system conferences. Project directors did note that the intangible benefit of providing increased access to instructional and support resources made some of their cost-benefit calculations moot over time. In many cases, the applications to which systems were put to use had not been anticipated in initial cost calculations. There was general consensus that once a technology system was in place in an institution it had incalculable impact on organizational development and institutional culture.

Western Cooperative for Educational Telecommunications
New Pathways to a Degree Evaluation -Results of Evaluation Environmental Scan

Most Important				Least Important
5	4	3	2	1
• Profile of population served • Number of students served • Student motivation for taking DE courses • Course completion • Course satisfaction • Media services for faculty • Media services for students • On-line library services • Cost of course delivery for tech based courses • Computer networks used • Pre/post course attitudes of students • Pre/post course attitudes of faculty	• Academic programs delivered • Faculty support services inventory • Library services inventory • Teaching evaluations • Student age • Student gender • Targeted audience served • Attitudes toward tech for direct instruction • Student self-esteem • Student learning style • Student learning strategies • Course grades • GPA • Barriers to student success • Learning incentives • Faculty incentives • Student guides • Faculty selection guidelines • Technology inventory • E-mail for students • Voice-mail for students • 800 numbers • Site facilitator training • Cost of delivering tech-supported courses • Bulletin boards used	• Telecom project eval • Outreach needs assess assessment • Outreach implement plans • Outreach evaluation • Delivery site profile • Student support services inventory • Profile of region served • Degrees provided • Courses provided • Tech proficiency • Attitudes teaching w/tech • Tech used per course • Student major • Residential distance from campus • Student enrollment proj • Student tech proficiency • Attitudes re: tech for instruc • General tech inventories • Student test scores • Assignment completion • Competency testing • Technology preferences • Course outlines • Course eval guidelines • Media/tech guidelines • Instruct design guidelines • Course devt guidelines • Tech based course summaries • # of faculty involved in DE • Retention of faculty • E-mail for faculty • Voicemail for fac/staff • On-line registration • On-line academic advising • Library resource inventory • Book/supply procurement • Fac rank of tech effectiveness • Fac rank of tech preferences	• Mission statement • System description • Telecom implement plans • Tech inventory • Programs provided • Professional prep (fac) • Rank • Tenure status • FT/PT status • Teaching style • FT/PT student status • Student demographics • Syllabus guides • Course selection outlines • Course content analysis • Course revision guides • Eval guidelines • Tech proficiency • Teaching incentives • Fac use of tech for teaching • Fac participation in tech based teaching • On-line financial aid advising • Off-campus site facilitator	• Annual Reports • Gov structure • Institutional history • Telecom needs assess • Accreditation • Fac age • Summaries of depts affected by tech delivery • Program guides • Fac recruit guidelines • Course devt guidelines • Course devt incentives • Student rank of tech per course • Satellites used • Fac gender • Org charts

New Pathways to a Degree

- **an initiative of the Annenberg/CPB Project;**
- **provided funding to seven projects, involving 27 colleges and universities and 3 state telecommunications networks:**
 - **Educational Network of Maine**
 - **Rochester Institute of Technology**
 - **University of West Virginia System**
 - **Oregon ED-NET**
 - **St. Catherine's College**
 - **Indiana University-Purdue University, Indianapolis**
 - **Northern Virginia Community College**
- **funded a two year external evaluation of the New Pathways project**

Wagner - AECT '93

Research Questions

- **What are the effects of technology upon student achievement in distance learning contexts?**
- **What is/are the most effective mix(es) for delivering college courses, programs and services to distant students?**
- **What variables determine cost-benefit of courses and programs delivered to distant students?**

~ Wagner - AECT '93

First, we needed a systematic framework for developing a comprehensive evaluation strategy;

Then we needed to identify variables within projects and across projects where comparisons could be made.

Wagner - AECT '93

Evaluation Provides Heuristics for Effective Decision-Making

Type of Evaluation

Type of Decision-Making

CONTEXT: environmental variables, conditions and contingencies

PLANNING

INPUT: resources needed to support project implementation

STRUCTURE/PROCUREMENT

PROCESS: operational effectiveness and procedural efficacy

IMPLEMENTATION

PRODUCTS: a variety of tangible outcome measures

**RECYCLING/REVISION/
INTEGRATION/TERMINATION**

Type of Evaluation	Objectives	Methodologies/ Data Sources	Relationship to Decision Making
CONTEXT	Operationally defines and describes the environment in which the project occurs Identifies the organizational conditions, needs, barriers to success and opportunities	• Annual Reports • Mission Statements • Histories • Strategic Plans • Needs Assessments • Enrollment data • Demographics • Technology plans • Resource plans DESCRIPTIVE POST-HOC HISTORICAL	Addresses the development of: • change strategies • leadership development strategies • technology integration plans • collaborative strategies PLANNING DECISIONS

Type of Evaluation	Objectives	Methodologies/ Data Sources	Relationship to Decision Making
INPUT	Identifies existing resources	Extant data and resource inventories:	Addresses the development of:
	Determines system capacities and capabilities Develops plans through which to acquire additional resources	• Student enrollment • enroll. projections • targeted curricula • inventories of equipment of library resources of faculty of sites to be served of student services DESCRIPTIVE FREQUENCIES GAP ANALYSES FORECASTING	• Resource procurement • Resource dedication • Economies of scale STRUCTURING DECISIONS

Type of Evaluation	Objectives	Methodologies/ Data Sources	Relationship to Decision Making
PROCESS	Identifies or predicts defects in the procedural design and its implementation Provides information about predetermined decisions Develops contingency planning Records procedural events and activities	• Structured Interviews • Structured Observations • Force Field Analyses	Actively promotes implementation, procedures, operations and management
		QUALITATIVE METHODS	IMPLEMENTATION DECISIONS

Type of Evaluation	Objectives	Methodologies/ Data Sources	Relationship to Decision Making
PRODUCT	To relate project outcomes to the project goals To relate outcomes to context, input and process data To suggest improvements To provide generalizable guidelines	• Descriptive frequencies • Satisfaction w/ technology • Technology proficiency • Student learning, persistence, interaction • Factor analysis of interviews and observational data	Decides when to continue, modify, revise, refocus or terminate a course of action, an intervention or an entire project REVISION, INTEGRATION AND TERMINATION DECISIONS QUANTITATIVE AND QUALITATIVE METHODS FOR DESCRIPTIVE AND INFERENTIAL REPORTING

Environmental Scan of Data Sources and Instrumentation

- **to determine the type of information being collected by the New Pathways projects;**
- **to determine categories of information which are common across all projects;**
- **to see if certain categories of information are seen as more useful than others for evaluative purposes;**
- **to determine if data collection instruments could be shared across projects.**

Wagner - AECT '93

Type of info	Is this info routinely collected?	Can it be used in reports?	Are forms available ?	Rank relative importance 5 = most, 1 = least
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1. Institutional Characteristics

2. Faculty Characteristics

3. Student Characteristics

4. Student Psychographics

5. Student Achievement

6. Course Development

7. Faculty Development

8. Support Services

9. Technology Mix

**117 variables from the
nine categories noted
here were included in
the environmental
scan document**

Most Important Variables for Evaluation Purpose:

- **Profile of population served**
- **Number of students served**
- **Student motivation for taking DE courses**
- **Course completion**
- **Student satisfaction with course**
- **Media services for students and faculty**
- **On-line library services**
- **Cost of course delivery**
- **Pre-post attitudes of students**
- **Pre-post attitudes of faculty**

Three Phases of Distance Education System / Program Development:

- Technological Reliability
- Support Services Availability
- Organizational Adaptability

Variables for evaluating the "success" of a distance education project will change with each developmental phase.